CLAIMS

What is claimed is:

1. A method of identifying a cDNA construct wherein the cDNA construct expresses a tagged polypeptide having a biochemical activity of interest comprising the steps of:

   a) preparing a tagged cDNA expression library comprising bacterial cells comprising tagged cDNA plasmid constructs;

   b) culturing the bacterial cells of step a) to produce clones wherein each clone corresponds to a single tagged cDNA construct;

   c) arraying the individual bacterial clones;

   d) pooling a predetermined number of arrayed clones and isolating plasmid DNA from them;

   e) transfecting suitable mammalian host cells with the pooled plasmid clones and maintaining the transfected cells under conditions suitable for the expression of the tagged cDNA construct, thereby producing tagged polypeptides;

   f) assaying the expressed tagged polypeptides for a biochemical activity of interest; and

   identifying a pool of clones comprising a cDNA construct encoding the tagged polypeptide having the biochemical activity of interest.

2. The method of Claim 1 wherein steps d) through f) are repeated until a single cDNA construct expressing a tagged polypeptide having the biochemical activity of interest is identified.

3. The method of Claim 1 wherein the tag is selected from the group consisting of: GST-, Myc-, HA-, FLAG- and His-.

4. The method of Claim 1 wherein preparing the tagged cDNA expression library of step a) comprises the steps of:

i) obtaining double-stranded cDNA from cells expressing a polypeptide with the biochemical activity of interest;

ii) ligating the cDNA into an expression vector wherein the expression vector comprises a coding region for a tag operably linked to a promoter to produce a tagged cDNA construct; and

iii) transforming competent bacterial cells with the tagged cDNA construct of step ii).

5. The method of Claim 4 wherein the tagged cDNA library comprises cDNA constructs having specific protein motifs that have been selected by polymerase chain reaction.

6. The method of Claim 4 wherein the promoter in step ii) is EF-1α.

7. The method of Claim 1 wherein the mammalian host cells used in step e) are 293 T fibroblast cells.

8. The method of Claim 1 wherein the biochemical activity of interest is selected from the group consisting of:

a) acting as a substrate for a specific enzyme;

b) being a specific enzyme;

c) interacting with specific antibodies;

d) forming specific protein-protein associations;

e) forming specific protein-nucleic acid associations;

f) interacting specifically with any biological element or compound;

g) possessing cell biological activity such as growth, differentiation, apoptosis, vascularization, motility or morphological change promoting or inhibiting ;

h) undergoing specific post-translational modifications (phosphorylation, glycosylation, ubiquitination, acetylation, proteolytic cleavage, *etc.*) in mammalian cells;

i) possessing any of the activities in a-h only in response to a specific stimuli in mammalian cells.

9. The method of Claim 1 wherein step d) each pool of clones comprises from about 2 to about 1000 clones.

10. A pool of clones comprising a cDNA construct encoding a tagged polypeptide having a biochemical activity of interest identified by the method of Claim 1.

11. A cDNA construct encoding a tagged polypeptide having a biochemical activity of interest identified by the method of Claim 1 or 2.

12. The method of Claim 1 wherein more than one expression library is prepared and each expression library comprises a different cell type wherein the cells are stimulated with a specific stimulus.